Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A peak to average power ratio reducer (PAPR) for a multi-carrier modulation (MCM) communication system comprising:

a MCM transmitter comprising:

a probability distribution transformer having an input for receiving an MCM signal for transmission, the MCM signal comprising a plurality of data packets, wherein the plurality of data packets represent a plurality of amplitude values, wherein the plurality of amplitude values is characterized by a substantially Gaussian probability density function, the probability distribution transformer for transforming the plurality of amplitude values to a plurality of transformed amplitude values in accordance with a probability distribution transform, wherein the plurality of transformed amplitude values is characterized by a substantially uniform probability density function, and the probability distribution transformer having an output for providing a transformed MCM signal comprising a plurality of transformed data packets, wherein the plurality of transformed data packets represent at least some of the plurality of transformed amplitude values of the corresponding transformed MCM signal; and

a MCM receiver comprising:

a probability distribution inverter having an input for receiving a corresponding transformed MCM signal, the probability distribution inverter for transforming the at least some of the plurality of transformed amplitude values to a plurality of inverted amplitude values in accordance with an inverse probability distribution ~~transform~~ transformer, wherein the plurality of inverted amplitude values is characterized by a substantially Gaussian probability density function, and the probability distribution inverter having an output for providing a recovered MCM signal comprising a plurality

of inverted data packets, wherein the plurality of inverted data packets represent at least some of the plurality of inverted amplitude values.

Claim 2 (original): A PAPR reducer in accordance with claim 1, wherein the probability distribution transformer comprises a plurality of linear transformers for transforming the plurality of amplitude values to the plurality of transformed amplitude values.

Claim 3 (original): A PAPR reducer in accordance with claim 2, wherein the plurality of linear transformers comprises at least one linear transformer for transforming a first predetermined band of amplitude values in accordance with the following equation:

$y = (a/\sigma)\, x$

where x is one of the plurality of amplitude values;
y is a corresponding one of the plurality of transformed amplitude values;
a is a predetermined constant; and
σ is standard deviation of the plurality of amplitude values.

Claim 4 (original): A PAPR reducer in accordance with claim 3, wherein the first predetermined band of amplitude values comprises $|x| \leq \sigma$.

Claim 5 (currently amended): A PAPR reducer in accordance with claim 2, wherein the plurality of linear transformers ~~comprise~~ comprises at least one predetermined pair of linear transformers for transforming a corresponding pair of predetermined bands of amplitude values.

Claim 6 (original): A PAPR reducer in accordance with claim 5, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of amplitude values comprise:

$y = (b/\sigma)x + c$ when $\sigma < x \leq 2\sigma$; and

$y = (b/\sigma)x - c$ when $-2\sigma \leq x < -\sigma$;

where x is one of the plurality of amplitude values;

y is a corresponding one of the plurality of transformed amplitude values;

b and c are predetermined constants; and

σ is standard deviation of the plurality of amplitude values.

Claim 7 (original): A PAPR reducer in accordance with claim 5, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of amplitude values comprise:

$y = (d/\sigma)x + e$ when $2\sigma < x \leq 6\sigma$; and

$y = (d/\sigma)x - e$ when $-6\sigma \leq x < -2\sigma$;

where x is one of the plurality of amplitude values;

y is a corresponding one of the plurality of transformed amplitude values;

d and e are predetermined constants; and

σ is standard deviation of the plurality of amplitude values.

Claim 8 (original): A PAPR reducer in accordance with claim 5, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of amplitude values comprise:

$y = f$ when $x > 6\sigma$; and

$y = -f$ when $x < -6\sigma$;

where x is one of the plurality of amplitude values;

y is a corresponding one of the plurality of transformed amplitude values;

f is a predetermined constant; and

σ is standard deviation of the plurality of amplitude values.

Claim 9 (original): A PAPR reducer in accordance with claim 1, wherein the probability distribution inverter comprises a plurality of linear transformers for transforming the plurality of transformed amplitude values to the plurality of inverted amplitude values.

Claim 10 (currently amended): A PAPR reducer in accordance with claim 9, wherein the plurality of linear transformers ~~comprise~~ comprises at least one linear transformer for a first predetermined band of transformed amplitude values in accordance with the following equation:

$s = (g\sigma)y$

where y is one of the plurality of transformed amplitude values;
s is a corresponding one of the plurality of inverted amplitude values;
g is a predetermined constant; and
σ is standard deviation of the plurality of transformed amplitude values.

Claim 11 (original): A PAPR reducer in accordance with claim 10, wherein the first predetermined band of transformed amplitude values comprises $|y| \leq 0.4$.

Claim 12 (original): A PAPR reducer in accordance with claim 9, wherein the plurality of linear transformers comprises at least one predetermined pair of linear transformers for a corresponding pair of predetermined bands of transformed amplitude values.

Claim 13 (original): A PAPR reducer in accordance with claim 12, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of transformed amplitude values comprise:

$s = (\sigma/h)(y - i)$ when $0.4 < y \leq 0.55$; and

$s = (\sigma/h)(y+i)$ when $-0.55 \leq y < -0.4$;

where y is one of the plurality of transformed amplitude values;

s is a corresponding one of the plurality of inverted amplitude values;

h and i are predetermined constants; and

σ is standard deviation of the plurality of transformed amplitude values.

Claim 14 (original): A PAPR reducer in accordance with claim 12, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of transformed amplitude values comprise:

$s = 10\sigma(y - j)$ when $0.55 < y \leq 0.95$; and

$s = 10\sigma(y+ j)$ when $-0.95 \leq y < -0.55$;

where y is one of the plurality of transformed amplitude values;

s is a corresponding one of the plurality of inverted amplitude values;

j is a predetermined constant; and

σ is standard deviation of the plurality of transformed amplitude values.

Claim 15 (original): A PAPR reducer in accordance with claim 12, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bans of transformed amplitude values comprise:

$s = 6\sigma$ when $y > 0.95$; and

$s = -6\sigma$ when $y < -0.95$;

where y is one of the plurality of transformed amplitude values;

s is a corresponding one of the plurality of inverted amplitude values; and

σ is standard deviation of the plurality of transformed amplitude values.

Claim 16 (original): A PAPR reducer in accordance with claim 2, wherein the inverse probability distribution transformer comprises a plurality of inverse linear transformers, where in the plurality of inverse linear transformers are the inverse of the plurality of linear transformers, the plurality of inverse linear transformers for transforming at least some of the plurality of transformed amplitude values to at least some of the plurality of amplitude values.

Claim 17 (original): A multi-carrier modulation (MCM) transmitter comprising:

a probability distribution transformer having an input for receiving an MCM signal for transmission, the MCM signal comprising a plurality of data packets, wherein the plurality of data packets represent a plurality of amplitude values, wherein the plurality of amplitude values is characterized by a substantially Gaussian probability density function, the probability distribution transformer for transforming the plurality of amplitude values to a plurality of transformed amplitude values in accordance with a probability distribution transform, wherein the plurality of transformed amplitude values is characterized by a substantially uniform probability density function, and the probability distribution transformer having an output for providing a transformed MCM signal comprising a plurality of transformed data packets, wherein the plurality of transformed data packets represent at least some of the plurality of transformed amplitude values.

Claim 18 (currently amended): A ~~PAPR reducer~~ MCM transmitter in accordance with claim 17, wherein the probability distribution transformer comprises a plurality of linear transformers for transforming the plurality of amplitude values to the plurality of transformed amplitude values.

Claim 19 (original): A MCM transmitter in accordance with claim 18, wherein the plurality of linear transformers comprise at least one linear transformer for a first predetermined band of amplitude values in accordance with the following equation:

$y = (a/\sigma)\, x$

where x is one of the plurality of amplitude values;

y is a corresponding one of the plurality of transformed amplitude values;

a is a predetermined constant; and

σ is standard deviation of the plurality of amplitude values.

Claim 20 (original): A MCM transmitter in accordance with claim 19, wherein the first predetermined band of amplitude values comprises $|x| \leq \sigma$.

Claim 21 (original): A MCM transmitter in accordance with claim 18, wherein the plurality of linear transformers comprise at least one predetermined pair of linear transformers for a corresponding pair of predetermined bands of amplitude values.

Claim 22 (original): A MCM transmitter in accordance with claim 21, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of amplitude values comprise:

$y = (b/\sigma)x + c$ when $\sigma < x \leq 2\sigma$; and

$y = (b/\sigma)x - c$ when $-2\sigma \leq x < -\sigma$;

where x is one of the plurality of amplitude values;

y is a corresponding one of the plurality of transformed amplitude values;

b and c are predetermined constants; and

σ is standard deviation of the plurality of amplitude values.

Claim 23 (original): A MCM transmitter in accordance with claim 21, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of amplitude values comprise:

$y = (d/\sigma)x + e$ when $2\sigma < x \leq 6\sigma$, and

$y = (d/\sigma)x - e$ when $-6\sigma \leq x < -2\sigma$;

where x is one of the plurality of amplitude values;

y is a corresponding one of the plurality of transformed amplitude values;

d and e are predetermined constants; and

σ is standard deviation of the plurality of amplitude values.

Claim 24 (original): A MCM transmitter in accordance with claim 21, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of amplitude values comprise:

$y = f$ when $x > 6\sigma$, and

$y = -f$ when $x < -6\sigma$;

where x is one of the plurality of amplitude values;

y is a corresponding one of the plurality of transformed amplitude values;

f is a predetermined constant; and

σ is standard deviation of the plurality of amplitude values.

Claim 25 (currently amended): A multi-carrier modulation (MCM) receiver comprising:

a probability distribution inverter having an input for receiving a transformed MCM signal, wherein the transformed MCM signal comprises a plurality of transformed data packets, wherein the plurality of data packets represent a plurality of transformed amplitude values, and wherein the plurality of transformed amplitude values is characterized by a substantially uniform probability density function, the probability distribution inverter for transforming at least some of the plurality of transformed amplitude values to a plurality of inverted amplitude values in accordance with an inverse probability distribution transform, wherein the plurality of inverted amplitude values is characterized by a substantially Gaussian probability density function, and the probability

distribution inverter having an output for providing a recovered MCM signal comprising a plurality of inverted data packets, wherein the plurality of inverted data packets represent at least some of the plurality of inverted amplitude values.

Claim 26 (currently amended): ~~A PAPR reducer~~ A MCM receiver in accordance with claim 25, wherein the probability distribution inverter comprises a plurality of linear transformers for transforming the plurality of transformed amplitude values to the plurality of inverted amplitude values.

Claim 27 (currently amended): ~~A PAPR reducer~~ A MCM receiver in accordance with claim 26, wherein the plurality of linear transformers comprise at least one linear transformer for a first predetermined band of transformed amplitude values in accordance with the following equation:

$s = (g\sigma)y$

where y is one of the plurality of transformed amplitude values;

s is a corresponding one of the plurality of inverted amplitude values;

g is a predetermined constant; and

σ is standard deviation of the plurality of transformed amplitude values.

Claim 28 (currently amended): ~~A PAPR reducer~~ A MCM receiver in accordance with claim 27, wherein the first predetermined band of transformed amplitude values comprises

$|y| \leq 0.4$.

Claim 29 (currently amended): ~~A PAPR reducer~~ A MCM receiver in accordance with claim 26, wherein the plurality of linear transformers comprises at least one predetermined pair of linear transformers for a corresponding pair of predetermined bands of transformed amplitude values.

Claim 30 (currently amended): ~~A PAPR reducer~~ A MCM receiver in accordance with claim 29, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bans of transformed amplitude values comprise:

$s = (\sigma/h)(y - i)$ when $0.4 < y \leq 0.55$; and

$s = (\sigma/h)(y+i)$ when $-0.55 \leq y < -0.4$;

where y is one of the plurality of transformed amplitude values;

s is a corresponding one of the plurality of inverted amplitude values;

h and i are predetermined constants; and

σ is standard deviation of the plurality of transformed amplitude values.

Claim 31 (currently amended): ~~A PAPR reducer~~ A MCM receiver in accordance with claim 29, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of transformed amplitude values comprise:

$s = 10\sigma(y - j)$ when $0.55 < y \leq 0.95$; and

$s = 10\sigma(y + j)$ when $-0.95 \leq y < -0.55$;

where y is one of the plurality of transformed amplitude values;

s is a corresponding one of the plurality of inverted amplitude values;

j is a predetermined constant; and

σ is standard deviation of the plurality of transformed amplitude values.

Claim 32 (currently amended): ~~A PAPR reducer~~ A MCM receiver in accordance with claim 29, wherein the at least one predetermined pair of linear transformers and the corresponding pair of predetermined bands of transformed amplitude values comprise:

$s = 6\sigma$ when $y > 0.95$; and

$s = -6\sigma$ when $y < -0.95$;

where y is one of the plurality of transformed amplitude values;
s is a corresponding one of the plurality of inverted amplitude values; and
σ is standard deviation of the plurality of transformed amplitude values.

Claim 33 (currently amended): ~~A PAPR reducer~~ A MCM receiver in accordance with claim ~~25~~ 26, wherein the probability distribution inverter comprises a plurality of inverse linear transformers, where in the plurality of inverse linear transformers are the inverse of the plurality of linear transformers, the plurality of inverse linear transformers for transforming at least some of the plurality of transformed amplitude values to at least some of the plurality of inverted amplitude values.

Claim 34 (currently amended): A method for peak to average power ratio reduction in a multi-carrier modulation (MCM) communication system comprising steps of:

a) receiving a MCM signal for transmission, wherein the MCM signal comprises a plurality of data packets, wherein the plurality of data packets represent a plurality of amplitude values, and wherein the plurality of amplitude values is characterized by a substantially Gaussian probability density function;

b) transforming the plurality of amplitude values to a plurality of transformed amplitude values in accordance with a probability distribution transform, wherein the plurality of transformed amplitude values is characterized by a substantially uniform probability density function;

c) providing a transformed signal, wherein the transformed signal comprises a plurality of transformed data packets, wherein the plurality of transformed data packets represent at least some of the plurality of transformed amplitude values;

d) transmitting the transformed signal on a communication channel of the MCM communication system;

e) receiving the transformed signal on the communication channel;

f) transforming the at least some of the plurality of transformed amplitude values to a plurality of inverted amplitude values in accordance with an inverse probability distribution transform, wherein the plurality of inverted amplitude values is characterized by a substantially Gaussian distribution; and

g) providing an inverted signal, wherein the inverted signal comprises a plurality of inverted data packets, wherein the plurality of inverted data packets represent some of the plurality of inverted amplitude values.

Claim 35 (original): A method in accordance with claim 34, wherein step (b) comprises the step of applying a plurality of linear transforms.

Claim 36 (original): A method in accordance with claim 35, wherein step (f) comprises the step of applying a plurality inverse linear transforms, wherein the plurality of inverse linear transforms are the inverse of the plurality of linear transforms.

Claim 37 (canceled)

Claim 38 (canceled)

Claim 39 (canceled)